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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,660	02/09/2004	Xiaohe Chen	200300677-1	1438

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EXAMINER	
SHOSHO, CALLIE E	
ART UNIT	PAPER NUMBER
1714	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,660	CHEN ET AL.	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. All outstanding rejections except for those described below are overcome by applicants' amendment filed 12/7/06.

The new grounds of rejection set forth below are necessitated by applicants' amendment and thus, the following action is final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(a) Claim 1 has been amended to recite "water-solubility of the water-soluble polyurethane is greater than about 0.1%". It is the examiner's position that this phrase fails to satisfy the written description requirement under the cited statute since there does not appear to be a written description requirement of the cited phrase in the application as originally filed, *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163.

As support for the above amendment, applicants point to page 4, lines 14-16 of the present specification.

However, while page 4, lines 9-11 of the present specification provides support to recite that the water-solubility of the water-soluble polyurethane is at least 0.1%, there is no support to recite that the water-solubility is greater than about 0.1% which encompasses water-solubility that is greater than values slightly above or below, i.e. about, 0.1% for which there is no support in the specification as originally filed.

Similarly, claim 21 has been amended to recite "water-solubility of the water-soluble polyurethane is greater than about 10%". As support for the above amendment, applicants point to page 4, lines 14-16 of the present specification. However, while page 4, lines 9-11 of the present specification provides support to recite that the water-solubility of the water-soluble polyurethane is at least 10%, there is no support to recite that the water-solubility is greater than about 10% which encompasses water-solubility that is greater than values slightly above or below, i.e. about, 10% for which there is no support in the specification as originally filed.

(b) Claim 1 has been amended to recite that the "amount of water-soluble polyurethane present in the ink composition is fully dissolved". It is the examiner's position that this phrase fails to satisfy the written description requirement under the cited statute since there does not appear to be a written description requirement of the cited phrase in the application as originally filed, *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163.

As support for the above amendment, applicants point to page 4, lines 14-16 of the present specification.

However, while page 4, lines 9-11 of the present specification discloses that a polyurethane is water-soluble if it has a water-solubility limit of at least 0.1%, preferably at least

5%, especially at least 10%, there is no disclosure in the specification as originally filed that the polyurethane is fully dissolved. While page 4 or the present specification defines what is meant by "water-soluble" polyurethane, there is no disclosure that such polymer is fully dissolved.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-3, 6-10, and 17-21 are rejected under 35 U.S.C. 102(a) as being anticipated by WO 03/097753.

WO 03/097753[1] discloses ink jet ink comprising 0.5-25%, preferably, 2-10% pigment, water-soluble polyurethane possessing acid number of 5-100, preferably 10-80, 1-15%, preferably 2-10%, C_1-C_8 alkanediol, and 5-20%, preferably 6-25%, co-solvent such as 1,3-dimethyl-2-imidazolidinone and 2-pyrrolidone. It is disclosed that the ratio of polyurethane to pigment is 5-100/100 and thus, it is calculated, based on the amount of pigment, that the polyurethane is present in amount of 0.1-10%. The ink does not require surfactant. The ink possesses viscosity of at most 20 cP. Further, there is disclosed process for printing an image into paper substrate using ink jet printer. Although there is no explicit disclosure of ink cartridge, it is

[1] It is noted that when utilizing WO 03/097753, the disclosures of the reference are based on Waki et al. (U.S. 2004/0242726) which is an English language equivalent of the reference. Therefore, the column and line numbers cited with respect to WO 03/097753 are found in Waki et al.

clear that the printer would necessarily inherently possess ink cartridge to store ink (paragraphs 1, 10, 13, 17-18, 20, 25, 56-57, 66-67, 133, 136, 138, 141, 145, 147, and 161). Given that WO 03/097753 disclose that the polyurethane is water-soluble and further given that the polyurethane possesses acid number as presently claimed, it is clear that the polyurethane would inherently possess water-solubility limit as presently claimed and would inherently be fully dissolved as presently claimed.

In light of the above, it is clear that WO 03/097753 anticipates the present claims.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 5 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/097753.

The disclosure with respect to WO 03/097753 in paragraph 5 above is incorporated here by reference.

The difference between WO 03/097753 and the present claimed invention is the requirement in the claims of acid number of the polyurethane.

WO 03/097753 discloses that the polyurethane possesses acid number of 5-100, preferably, 10-80, while the present claims require polyurethane possessing acid number of 30-70 or 40-60.

However, as set forth in MPEP 2144.05, in the case where the claimed range "overlap or lie inside ranges disclosed by the prior art", a *prima facie* case of obviousness exists, In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Further, it would have been within the skill level of one of ordinary skill in the art to recognize that controlling the acid number of the polyurethane controls the properties of the polyurethane and thus, the ink such as water resistance, storage stability, viscosity, etc.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to utilize polyurethane in WO 03/097753 with acid number, including that presently claimed, in order to produce ink with desired properties, and thereby arrive at the claimed invention.

8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/097753 in view of Iu et al. (U.S. 6,102,998).

The disclosure with respect to WO 03/097753 in paragraph 5 above is incorporated here by reference.

The difference between WO 03/097753 and the present claimed invention is the requirement in the claims of specific solvent.

Iu et al., which is drawn to ink jet ink, disclose the use of hydantoin solvent identical to that presently claimed in order to produce ink with enhanced image quality, waterfastness, and dry time (col.4, lines41-65 and col.9, lines 20-24).

In light of the motivation for using hydantoin solvent disclosed by Iu et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such

hydantoin solvent in the ink of WO 03/097753 in order to produce ink with enhanced image quality, waterfastness, and dry time, and thereby arrive at the claimed invention.

9. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/097753 in view of Ma et al. (U.S. 5,648,405).

The disclosure with respect to WO 03/097753 in paragraph 5 above is incorporated here by reference.

The difference between WO 03/097753 and the present claimed invention is the requirement in the claims of surface tension of the ink.

Ma et al., which is drawn to ink jet ink, disclose that in order for ink to be suitable for ink jet printing the ink must possesses surface tension of 20-70 dyne/cm given that the jet velocity, separation length of droplets, drop size, and stream stability of the ink are effected by surface tension (col.5, lines 39-45).

In light of the motivation for using ink with specific surface tension disclosed by Ma et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ink with such surface tension, including that presently claimed, in order that the ink is suitable for, and effectively utilized in, ink jet printing, and thereby arrive at the claimed invention.

10. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/097753 in view of Elwakil (U.S. 5,833,743).

The disclosure with respect to WO 03/097753 in paragraph 5 above is incorporated here by reference.

The difference between WO 03/097753 and the present claimed invention is the requirement in the claims of pH of the ink.

Elwakil, which is drawn to ink jet ink, disclose the use of ink possessing pH of 9-11 in order to prevent the ink from corroding the printer (col.5, lines 8-19).

In light of the motivation for using ink with specific pH disclosed by Elwakil as described above, it therefore would have been obvious to one of ordinary skill in the art to control the pH of the ink of WO 03/097753 to such values in order that the ink does not corrode the printer, and thereby arrive at the claimed invention.

11. Claims 1-10 and 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. (U.S. 2002/0019458) in view of Hayashi (U.S. 6,500,248).

The rejection is adequately set forth in paragraph 9 of the office action mailed 9/8/06 and is incorporated here by reference.

Further, it is noted that given that Hirasa et al. disclose that the polyurethane is water soluble and given that the polyurethane possesses acid number and molecular weight as presently claimed, it is clear that such polyurethane would intrinsically possesses water-solubility limit as presently claimed and that the polyurethane would intrinsically be fully dissolved as presently claimed.

12. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. in view of Hayashi as applied to claims 1-10 and 17-24 above, and further in view of Iu et al. (U.S. 6,102,998).

The rejection is adequately set forth in paragraph 10 of the office action mailed 9/8/06 and is incorporated here by reference.

13. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. in view of Hayashi as applied to claims 1-10 and 17-24 above, and further in view of Ma et al. (U.S. 5,648,405).

The rejection is adequately set forth in paragraph 11 of the office action mailed 9/8/06 and is incorporated here by reference.

14. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. in view of Hayashi as applied to claims 1-10 and 17-24 above, and further in view of Elwakil (U.S. 5,833,743).

The rejection is adequately set forth in paragraph 12 of the office action mailed 9/8/06 and is incorporated here by reference.

Response to Arguments

15. Applicants' arguments regarding Valentini et al. (U.S. 2005/0020730) and Nichols et al. (U.S. H2113H) have been considered but they are moot in view of the discontinuation of the use of these references against the present claims.

16. Applicants' arguments filed 12/7/06 have been fully considered but, with the exception of arguments relating to Valentini et al. and Nichols et al., they are not persuasive.

Specifically, applicants argue that the examiner has failed to establish a *prima facie* case of obviousness with respect to the combination of Hirasa et al. with Hayashi given that there is no motivation to combine the references and no reasonable expectation of success. Applicants argue that while Hayashi teaches the use of 1,2-alkyldiol as presently claimed, Hayashi does not teach the addition of 1,2-alkyldiol to any ink but only to the particular ink of Hayashi.

It is noted that Hirasa et al. disclose ink jet ink comprising 2-8% pigment, 8-70% water-soluble polyurethane possessing weight average molecular weight of 5,000-20,000 and acid number of 55-150, and 5-30% solvent including 2-pyrrolidone, however, there is no disclosure of 1,2-alkyldiol as presently claimed. This is why Hirasa et al. is combined with Hayashi.

Hayashi, which is also drawn to ink jet ink, discloses using 1,2-alkyldiol as presently claimed in order to improve color development, effectively prevent feathering or bleeding in prints, and to improve storage stability of the ink. Further, attention is drawn to comparative data of Hayashi that discloses that ink comprising 1,2-hexanediol (example 1) is superior to identical ink not comprising 1,2-hexanediol (comparative example 1) in terms of feathering, bleeding, and nozzle clogging. Thus, it is clear that the presence or absence of 1,2-alkyldiol directly effects the properties of ink.

Further, it is noted that in addition to being in the same field of endeavor of Hirasa et al., Hayashi discloses the use of ink comprising water, pigment, water-soluble emulsion comprising polyurethane, and 2-pyrrolidone as does the ink of Hirasa et al. Further, it is noted that the ink of

Hirasa et al. is open to the inclusion of additional ingredients, i.e. "it is also possible to add where necessary other additives".

Thus, given that Hayashi is drawn to same field of endeavor as Hirasa et al., i.e. ink jet ink, and comprises similar ingredients to the ink of Hirasa et al., given that Hirasa et al. is open to the inclusion of addition ingredients, given that Hayashi provides motivation for using 1,2-alkyldiol and shows that ink comprising 1,2-alkyldiol is superior to ink not comprising 1,2-alkyldiol, it is the examiner's position that there is motivation to combine Hirasa et al. with Hayashi and that such combination has a reasonable expectation of success.

Applicants argue that there is no reasonable expectation of success when combining Hirasa et al. with Hayashi given that while a particular ingredient may provide certain properties in a first ink, it may be unable to provide these properties to a second ink or may even have detrimental effect on the ink.

However, while there may be some level of unpredictability involved when combining the references, on the one hand, it would have been within the skill level of one of ordinary skill in the art to control the amount of 1,2-alkyldiol added to the ink of Hirasa et al. in order that the 1,2-alkydiol would not negatively effect the ink. On the other hand, it is noted that obviousness does not require absolute predictability, *In re Miegel and Verbanc*, 159 USPQ 716 (CCPA 1968). Given that Hayashi discloses that the presence or absence of 1,2-alkydiol in ink jet ink directly effects the overall composition of the ink in terms of feathering, bleeding, nozzle clogging, etc., it is the examiner's position that one of ordinary skill in the art would have a reasonable expectation of success when combining Hirasa et al. with Hayashi.

Applicants also argue that while Ma et al. disclose desirability of inks with viscosity less than 10 cP, this falls far short of teaching specifically claimed viscosity ranges. Applicants also note that claims 13-14 further require that the ink has specific surface tension.

However, it is noted that as set forth in MPEP 2144.05, in the case where the claimed range "overlap or lie inside ranges disclosed by the prior art", a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Further, it is significant to note that Ma et al. disclose that jet velocity, separation length of droplets, drop size, and stream stability are greatly affected by the viscosity of the ink and that ink suitable for ink jet printing should possess viscosity less than 10 cP. Therefore, it would have been obvious to one of ordinary skill in the art to control viscosity of ink of Hirasa et al. to values, including that presently claimed, in order to produce ink that is effectively utilized in, and printed from, ink jet printer, and thereby arrive at the claimed invention.

Further, it is noted that Hirasa et al. teach that the ink possesses surface tension of 30-35 dyne/cm (paragraph 51).

In light of the above, it is the examiner's position that the combination of Hirasa et al. with Hayashi remains relevant against the present claims.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
3/17/07